

Assessment of Acute Care Hospital Nurse Turnover Rates and Factors Affecting Turnover

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ABSTRACT

Background

The global nursing shortage is exacerbated by high nurse turnover, which negatively impacts healthcare institutions by worsening nurse-to-patient ratios, increasing burnout, and contributing to higher operational costs. Previous research has primarily focused on nurse retention intentions rather than actual turnover rates, with limited studies addressing a broad range of hospital settings and nurse characteristics. Understanding the turnover rates and factors influencing nurse attrition is crucial for healthcare management and improving patient care.

Methods

This retrospective cohort study utilized hospital records from acute care hospitals across the country. A total of 96,158 nurses were included in the study, Survival analysis, including Kaplan-Meier estimation and Cox proportional hazards regression, was used to estimate turnover rates and identify factors influencing nurse resignation. Variables analyzed included gender, career duration, hospital region, hospital type, ownership, and staffing levels.

Results

The overall turnover rate was 49.7%, with male nurses (64.5%) showing higher turnover than female nurses (49.3%). Nurses with less than one year of experience had the highest turnover rates (66.2%), followed by those with 1 to <3 years (61.5%). Turnover rates were highest in smaller hospitals, rural settings, and private hospitals.

Cox regression analysis identified several significant factors influencing turnover, including career duration (HR = 2.11 for <1 year), hospital size, ownership type (HR = 1.30 for private hospitals), and staffing levels (HR = 1.57 for low staffing).

Conclusion

Nurse turnover is influenced by multiple factors, including experience, hospital characteristics, and staffing levels. Strategies to reduce turnover should focus on improving working conditions in smaller hospitals, increasing staffing levels, and providing support for early-career nurses. These findings are essential for healthcare management to retain nurses and ensure the delivery of high-quality patient care.

Introduction

The global nursing shortage is a significant challenge, affecting healthcare systems worldwide, with many countries facing similar issues. This shortage occurs when there is a mismatch between the demand for nursing professionals and their availability [1]. A key factor exacerbating this shortage is nurse turnover, which worsens the imbalance. Prolonged nurse shortages within healthcare institutions can make it increasingly difficult to maintain an acceptable nurse-to-patient ratio, leading to heightened nurse dissatisfaction, burnout, errors, and turnover. These issues not only result in poorer patient outcomes, such as higher mortality rates, but also contribute to an increase in the financial strain on healthcare facilities, as additional resources are needed to address turnover-related costs [2, 3, 4]. Nurse turnover's effects on hospital finances are significant, as it leads to increased resource allocation, necessitating hospital expenditures for further expansion and recruitment [5]. Thus, addressing nurse turnover is crucial for both improving hospital management and minimizing the negative effects on patient care.

Research indicates that high turnover rates, particularly among newly graduated nurses, are a significant factor contributing to the overall nurse shortage. Additionally, turnover rates tend to vary across hospitals, with disparities between institutions of different sizes. National surveys conducted by healthcare organizations assess nurse turnover regularly. These surveys reveal that while the overall turnover rate has seen a decrease over time, the gap between large hospitals and smaller institutions remains notable. Furthermore, turnover among new graduate nurses continues to be a significant concern, with rates steadily increasing over the years [6, 7, 8].

Despite the growing attention on nurse turnover, much of the research focuses on understanding nurses' intentions to leave their roles, with fewer studies examining actual turnover rates directly. Previous studies typically focus on small sample sizes, often limited to new graduate nurses, and rarely include variables related to hospital characteristics, making it difficult to generalize their findings to all nurses in the healthcare sector [9, 10, 11, 12]. Given these limitations, it is important to gather comprehensive and representative data on turnover rates across all hospitals to better understand the factors contributing to nurse attrition and inform policies aimed at reducing turnover.

Methods

This is a retrospective observational approach, utilizing cohort data derived from hospital status records. The study data were submitted to the relevant national health authority by various acute care hospitals, including general and specialized medical institutions. The researchers requested hospital status data from the authority, focusing on nurse employment records. The dataset received included information on hospital nurses, and those registered in the hospital status. Initially, 97,591 nurses were included in the study, but 1,433 nurses who had resigned. Consequently, data for 96,158 nurses were analyzed.

The "event" in this study was defined as a nurse's resignation from their hospital position. If a nurse's resignation was recorded within the observation period, it was assigned a value of "1," indicating the occurrence of the event. If no resignation was recorded, the data were classified as "0," representing censored data.

The independent variables in this study included gender, work experience, hospital region, hospital type, hospital ownership, hospital category, and nurse staffing levels in general units. Gender was categorized as either female or male. Work experience was calculated from the nurse's licensure date to the start of the observation period. Hospital region was divided into specific geographical areas. Hospital settings were classified into urban, suburban, and rural locations. Hospital ownership was categorized into public, private, and academic institutions. Hospitals were categorized by type, such as specialized, general, and medium/small hospitals. Nurse staffing levels in general units were classified into seven grades based on the nurse-to-bed ratio, which is aimed at ensuring adequate nurse staffing levels for quality patient care. For example, Grade 1 hospitals have the lowest nurse-to-bed ratios, indicating better staffing, while Grade 7 hospitals have the highest ratios, indicating poorer staffing levels. Hospitals lacking staffing data were classified as "unassigned." This staffing classification system was based on the number of beds per nurse during the study period.

Analysis

Descriptive statistics were employed to analyze the distribution of participants' characteristics in relation to the occurrence of the event. Kaplan–Meier survival analysis was used to estimate the likelihood that nurses would remain employed in their hospitals throughout the study period. The log-rank test was conducted to determine differences in survival rates between various groups defined by the independent variables. Turnover probabilities were calculated using the formula "1 – probability of retention." To identify factors influencing nurse turnover, Cox's proportional hazards regression was performed, with the results presented as hazard ratios (HRs) along with 95% confidence intervals. The analysis was conducted using SPSS 24.0 (IBM Corp., Armonk, NY, USA).

Results

a total of 96,158 hospital nurses were tracked, with 49.7% (47,760) experiencing resignation events. Turnover occurred in 64.5% of male nurses and 49.3% of female nurses. When categorized by career duration, turnover rates were highest among

nurses with less than one year of experience (66.2%), followed by those with 1 to <3 years (61.5%), 3 to <5 years (54.3%), and those with 5 years or more (42.1%) (Table 1). Among hospital characteristics, the highest turnover rates were found in the following categories: 53.7% in a specific hospital region, 56.6% in rural hospital settings, 76.1% in smaller hospital types, 57.9% in private hospital ownership, and 72.3% in hospitals with unassigned staffing grades.

Table 2 presents the results of the multivariate Cox’s proportional hazard regression analysis. Male nurses (HR = 1.19) were found to have a significantly higher likelihood of resignation compared to female nurses. Nurses with career durations of less than one year (HR = 2.11) or 1 to <3 years (HR = 1.91) were also more likely to resign compared to those with 5 years or more of experience. Nurses in metropolitan (HR = 1.24) or medium/small city (HR = 1.11) settings had a higher likelihood of resignation compared to those working in rural areas. Nurses employed by private hospitals (HR = 1.30) were significantly more likely to resign than those working in public hospitals. Furthermore, nurses working in smaller or general hospitals (HR = 2.99 and HR = 1.63, respectively) were more likely to leave compared to those in tertiary hospitals. Finally, nurses working in general units with the lowest nurse staffing levels (seventh or unassigned staffing grades) (HR = 1.57) were significantly more likely to resign compared to those in units with the highest staffing levels, indicating a link between lower staffing levels and higher turnover rates (Table 2).

Table 1. Resignation Status According to Individual and Hospital Characteristics of Nurses for 5 Years.

Variables	Categories	Not resignation		Resignation		Total	
		n	% ^a	n	% ^a	n	% ^b
Gender	Women	47,584	50.7	46,278	49.3	93,862	97.6
	Men	814	35.5	1,482	64.5	2,296	2.4
Career duration (year) ^c	<1	3,289	33.8	6,432	66.2	9,721	10.1
	1 - 2	6,506	38.5	10,390	61.5	16,896	17.6
	3 - 4	6,279	45.7	7,452	54.3	13,731	14.3
	≥5	32,324	57.9	23,485	42.1	55,809	58.0
Hospital region	SO	14,433	54.7	11,940	45.3	26,373	27.4
	KI	10,043	47.6	11,069	52.4	21,112	22.0
	DC	3,808	49.6	3,869	50.4	7,677	8.0
	DG	4,736	48.6	5,007	51.4	9,743	10.1
	PG	7,440	46.3	8,627	53.7	16,067	16.7
	GJ	5,671	50.5	5,563	49.5	11,234	11.6
	KW	1,674	59.0	1,163	41.0	2,837	3.0
JJ	593	53.2	522	46.8	1,115	1.2	
Hospital setting	Metropolitan	27,843	51.2	26,497	48.8	54,340	56.5
	Medium/small city	19,451	49.5	19,823	50.5	39,274	40.8
	Rural	1,104	43.4	1,440	56.6	2,544	2.6

Hospital ownership	Public	4,686	53.4	4,094	46.6	8,780	9.1
	University	20,163	64.0	11,331	36.0	31,494	32.8
	Private	23,549	42.1	32,335	57.9	55,884	58.1
Hospital type	Tertiary hospital	21,575	67.7	10,275	32.3	31,850	33.1
	General hospital	22,171	49.5	22,650	50.5	44,821	46.6
	Medium/small hospital	4,652	23.9	14,835	76.1	19,487	20.3
Nurse staffing level for general units	Grade 1	4,881	65.9	2,524	34.1	7,405	7.7
	Grade 2	12,820	56.9	9,698	43.1	22,518	23.4
	Grade 3	19,571	56.0	15,382	44.0	34,953	36.3
	Grade 4	3,160	41.8	4,397	58.2	7,557	7.9
	Grade 5	2,513	46.1	2,939	53.9	5,452	5.7
	Grade 6	1,972	33.0	4,010	67.0	5,982	6.2
	Grade 7	1,093	29.9	2,565	70.1	3,658	3.8
	Unassigned	2,388	27.7	6,245	72.3	8,633	9.0
Total		48,398	50.3	47,760	49.7	96,158	100.0

Note. DC = Daejeon/Choongchug; DG = Daegu/Gyeongbuk; GJ = Gwangju/Julla; JJ = Jeju; KI = Kyunggi/Incheon; KW = Kangwon; PG = Pusan/Ulsan/Gyeongnam; SO = Seoul.

a % of row.

b % of column.

c Career duration was classified as of January 1.

Table 2. Factors Influencing Turnover of Acute Care Hospital Nurses: Multivariate Cox's Proportional Hazard Regression.

Variables	HR	95% CI	p
Nurse characteristic			
Gender			
Women	1.00		
Men	1.19	1.13–1.26	<.001
Career duration^a			
<1	2.11	2.05–2.17	<.001
1 - 2	1.91	1.86–1.95	<.001
3 - 4	1.56	1.52–1.60	<.001
≥5	1.00		
Hospital characteristic			
Hospital setting			
Metropolitan	1.24	1.17–1.31	<.001
Medium/small city	1.11	1.06–1.18	<.001
Rural	1.00		
Hospital ownership			

Public	1.00		
University	1.02	0.98–1.06	.38
Private	1.30	1.26–1.34	<.001
Hospital type			
Tertiary hospital	1.00		
General hospital	1.63	1.59–1.68	<.001
Medium/small hospital	2.99	2.88–3.09	<.001
Nurse staffing level for general units			
Grade 1	1.00		
Grade 2	1.25	1.19–1.31	<.001
Grade 3	1.22	1.17–1.28	<.001
Grade 4	1.45	1.38–1.53	<.001
Grade 5	1.19	1.12–1.26	<.001
Grade 6	1.51	1.43–1.59	<.001
Grade 7 or unassigned	1.57	1.49–1.66	<.001

Note. CI = confidence interval; HR = hazard ratio

a Career duration was classified as of January 1.

Discussion

This study aimed to examine trends in hospital nurse turnover rates and identify the contributing factors. The findings revealed cumulative turnover probabilities of 0.17, 0.38, and 0.50 for the first, third, and fifth years, respectively, which corresponds closely with turnover rate reports from healthcare organizations [12]. The turnover probability for nurses with less than one year of experience was 0.22 in the first year, 0.51 in the third year, and 0.62 in the fifth year. These figures were somewhat higher than the turnover rate for new graduate nurses reported by earlier studies, with the observed rate being marginally higher than that from studies using data collected before 2010, yet comparable to more recent reports [15]. These results align with studies showing that nurse turnover among new graduates has risen over recent years, with a trend of increasing attrition observed across multiple cohorts.

Moreover, the study revealed that high turnover rates are not limited to new graduate nurses. This highlights the need for future research to broaden its focus to include not only new graduates but also nurses in their early career stages (0–3 years), as they experience high turnover rates similar to those of new graduates.

The study also explored various factors that influence nurse turnover. All variables included in the Cox regression model were found to be statistically significant. However, a discrepancy was noted in the findings for hospital settings when comparing survival and Cox regression analyses. The survival analysis indicated higher turnover probabilities in rural hospitals compared to urban areas, but Cox regression showed that turnover risks were significantly higher in metropolitan and mid-sized cities compared to rural hospitals. This contradiction can be explained by the concentration of hospitals and nursing staff in urban centers, leading to higher

turnover in these areas. Previous research supports this finding, suggesting that large urban hospitals have greater access to nurses, contributing to higher turnover rates compared to rural hospitals [19].

Regarding hospital type, the study found a significantly higher turnover rate in smaller hospitals. Nurses in medium and small-sized hospitals had nearly three times the likelihood of resigning compared to those in larger hospitals, consistent with earlier findings in Korea. Smaller hospitals often face poorer working conditions, including lower wages and higher patient-to-nurse ratios, which could contribute to increased turnover in these settings [7,22]. These results suggest that addressing working conditions in smaller hospitals could be crucial in reducing turnover rates.

Hospital ownership was another factor influencing turnover rates. Private hospitals had a higher turnover hazard ratio compared to public hospitals, suggesting that non-profit and public hospitals may offer more favorable working conditions. Studies in other countries have similarly found that public hospitals often provide better job satisfaction and organizational commitment, which can help retain nursing staff [23,25]. Therefore, improving the working environment in private hospitals, including benefits and support systems, could help lower turnover rates.

Furthermore, the study highlighted the impact of nurse staffing levels on turnover. Nurses in hospitals with lower staffing levels were more likely to leave their positions. Specifically, nurses in units with low nurse-to-patient ratios were 57% more likely to resign compared to those in units with optimal staffing levels. Research has shown that insufficient staffing often leads to dissatisfaction with working conditions, contributing to higher turnover rates [26]. To address this, it is essential to improve nurse staffing policies, particularly in hospitals with low staffing grades.

Despite the useful insights from this study, some limitations must be acknowledged. The data used were administrative records that provided demographic information and hospital characteristics, but did not include factors related to nurses' working conditions, job satisfaction, or organizational culture, which have been identified as key determinants of turnover in other studies [28,29]. Future research should include these variables to provide a more comprehensive understanding of nurse turnover.

The findings from this study offer valuable information for developing policies aimed at reducing turnover rates, especially among nurses with less than three years of experience. Key factors such as hospital location, size, ownership type, and staffing levels should be considered when designing interventions to improve nurse retention. Addressing the issues of working conditions and staffing shortages in smaller hospitals and private institutions is crucial to reducing turnover and improving the overall quality of care.

Conclusion

This study examined the turnover rates of hospital nurses and identified the factors influencing these rates. The turnover probability was highest among nurses with fewer than three years of experience, highlighting the importance of focusing on this group in future research. Factors such as hospital location, size, staffing levels, and ownership type were found to significantly influence nurse turnover. It is essential to

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address the working conditions in smaller hospitals and improve nurse staffing levels to reduce turnover. Future policies should consider these findings to help develop strategies to retain nursing staff and ensure high-quality healthcare services.

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